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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/888,227	06/22/2001	Anant Sahai	60021-0012	7531

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EXAMINER	
AHN, SAM K	

ART UNIT	PAPER NUMBER
2611	

DATE MAILED: 03/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/888,227	SAHAI ET AL.	
	Examiner	Art Unit	
	Sam K. Ahn	2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 January 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-87* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *33-87* is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 June 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *010506*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

1. Claims 1-6 and 19-32 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Under the recently provided *Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility*, wherein the applicant appears to be aware of, the claims 1-5 and 19-32 are directed to a non-statutory subject matter.

On page 52 of the *Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility,* explains that "Data structures not claimed as embodied in computer-readable media are descriptive material per se and are not statutory because they are not capable of causing functional change in the computer. See, e.g., Warmerdam, 33 F.3d at 1361,31 USPW2d at 1760 (claim to a data structure per se held nonstatutory)".

On page 55, is further explained that "a claimed signal is clearly not a "process" under 101 because it is not a series of steps. The other three 101 classes of machine, compositions of matter and manufactures "relate to structural entities and can be grouped as 'product' claims in order to contrast them with process claims." 1 D. Chisum, Patents 1.02 (1994). A claimed signal has no physical

structure, does not itself perform any useful, concrete and tangible result and, thus, does not fit within the definition of a machine.

In this application, it appears that the claims recite what may fit under the combination of "Data Structures" and "Electro-Magnetic Signals", wherein both cases are directed to a non-statutory subject matter, wherein claim 6 directly depend on claim 4.

The claims merely recite a "Data Structures" computed by "selecting..., weight... and summing..." the "data blocks", without any interrelationships between the data structure and hardware components, thus is a non-statutory subject matter.

The claims further recite "Electro-Magnetic Signals", particularly "target frequency" and "selected frequency", wherein the claimed signal is not a process (note p.32-33) wherein process must be either (A) result in a physical transformation for which a practical application is either disclosed in the specification or would have been known to a skilled artisan, or (B) be limited to a practical application which produces a useful, tangible, and concrete result. The claim signal, furthermore, is not under classes of machine, compositions of matter and manufactures. Thus, the claimed subject matter is not a statutory subject matter.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the ***weighting... to***

a difference between the target frequency and the selected frequency must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 7-18 and 19-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akopian USP 6,735,243 B1 (cited previously) in view of Lang USP 5,566,202 (cited previously) and Rilling USP 6,628,969 B1 (cited previously) and in further view of Kaku et al. US 5,963,593 (Kaku).

Regarding claims 1 and 19, Akopian teaches a method for summing integrals at a target frequency of a plurality of target frequencies, the method comprising the steps of: accessing a set of correlation values corresponding to a set of data blocks (see Fig.5) wherein: the set of data blocks together make up a sampled data that is associated with a received signal (section 0 ~ section $N_{se} - 1$); and each correlation values from the set of correlation values corresponds to a calculated correlation integrals that are integrated (combined or summed,note col.10, line 22 in Fig.5) over one corresponding data block from the se of data blocks at a plurality of frequencies from a set of frequencies (w_1~w_k).

However, Akopian does not teach selecting correlation values that is closest to the target frequency, but combines the correlation values for each of the frequencies.

Lang teaches selecting (86,88 in Fig.2) correlation values that is closest to the target frequency (note col.2, lines 9-14 and col.3, line 40 – col.4, line 16).

Therefore, it would have been obvious to one skilled in the art at the time of the

invention to incorporate the teaching of Lang in the system of Akopian by selecting the correlation that is closest to the target frequency for the purpose of further executing the step of providing frequency compensation signal (output of 26 in Fig.1) through the selected correlation value, and thus control the timing of quantizing (in 14,16).

However, Akopian in view of Lang do not explicitly teach weighting and summing the selected correlation values, wherein each of the values are represented as I and Q values.

Rilling teaches receiving the selected correlation values (output of 20 in Fig.1) weighting (26) and summing (30) the weighted pairs of I and Q values.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the teaching of Rilling in the system of Akopian in view of Lang by coupling the output of selector (MUX in Fig.2 of Lang) to the weighting step (26) for the purpose of producing a feedback signal to reduce interference, as taught by Rilling (note col.4, lines 6-8). And further, it would have been obvious to one skilled in the art at the time of the invention to incorporate the teaching of Rilling in the system of Akopian and Lang by computing the correlation values represented as I and Q values, as computation in any part of a transmitter or a receiver as in-phase or quadrant, as computation in I and Q values are well-known in the art as these values simplifies computation in any part of the system.

However, Akopian in view of Lang and Rilling do not explicitly teach wherein weighting step is performed according to a difference between the target frequency and the selected frequency.

Kaku teaches weighting step is performed according to a difference between the target frequency (output of 7 in Fig.3) and the selected frequency (5, note col.14, lines 18-27 and 34-45 wherein the output of 6 is a frequency error between the received frequency or selected frequency and the target frequency or reference value that represents the reference frequency to obtain the result of the frequency error). Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the teaching of weight generator of Kaku in the weight generator of Rilling for the purpose of providing a low manufacturing cost to the overall system by processing the equalizer control method of Kaku (note col.3, lines 18-24). It is well-known to one skilled in the art that a correlator is incorporate in an equalizer, thus correlating and adaptively weighting through the weights received by the weight generator of Kaku, one skilled in the art would recognize that the low-cost system would provide weighted (26 of Rilling) and summed (30) pairs of I and Q values.

Regarding claims 7,13 and 14, Akopian teaches a method for summing integrals at a target frequency of a plurality of target frequencies, the method comprising the steps of: accessing a set of correlation values corresponding to a set of data blocks (see Fig.5) wherein: the set of data blocks together make up a sampled

data that is associated with a received signal (section 0 ~ section N_{se} – 1); and each correlation values from the set of correlation values corresponds to a calculated correlation integrals that are integrated (combined or summed,note col.10, line 22 in Fig.5) over one corresponding data block from the se of data blocks at a plurality of frequencies from a set of frequencies (w_1~w_k). Akopian further teaches dividing the range of frequency into a first set of frequency intervals (coarse) and second set of frequency intervals (fine, note col.2, lines 45-48 and 60-63 and col.8, lines 20-25).

However, Akopian does not teach selecting correlation values that is closest to the target frequency, but combines the correlation values for each of the frequencies.

Lang teaches selecting (86,88 in Fig.2) correlation values that is closest to the target frequency (note col.2, lines 9-14 and col.3, line 40 – col.4, line 16).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the teaching of Lang in the system of Akopian by selecting the correlation that is closest to the target frequency for the purpose of further executing the step of providing frequency compensation signal (output of 26 in Fig.1) through the selected correlation value, and thus control the timing of quantizing (in 14,16).

However, Akopian in view of Lang do not explicitly teach weighting and summing the selected correlation values, wherein each of the values are represented as I and Q values.

Rilling teaches receiving the selected correlation values (output of 20 in Fig.1) weighting (26) and summing (30) the weighted pairs of I and Q values; and estimating the carrier frequency from the summed weighted pairs of I and Q correlation values (Adaptive Array Output Signal). Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the teaching of Rilling in the system of Akopian in view of Lang by coupling the output of selector (MUX in Fig.2 of Lang) to the weighting step (26) for the purpose of producing a feedback signal to reduce interference, as taught by Rilling (note col.4, lines 6-8). And further, it would have been obvious to one skilled in the art at the time of the invention to incorporate the teaching of Rilling in the system of Akopian and Lang by computing the correlation values represented as I and Q values, as computation in any part of a transmitter or a receiver as in-phase or quadrant, as computation in I and Q values are well-known in the art as these values simplifies computation in any part of the system. However, Akopian in view of Lang and Rilling do not explicitly teach wherein weighting step is performed according to a difference between the target frequency and the selected frequency.

Kaku teaches weighting step is performed according to a difference between the target frequency (output of 7 in Fig.3) and the selected frequency (5, note col.14, lines 18-27 and 34-45 wherein the output of 6 is a frequency error between the received frequency or selected frequency and the target frequency or reference value that represents the reference frequency to obtain the result of the

frequency error). Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the teaching of weight generator of Kaku in the weight generator of Rilling for the purpose of providing a low manufacturing cost to the overall system by processing the equalizer control method of Kaku (note col.3, lines 18-24). It is well-known to one skilled in the art that a correlator is incorporate in an equalizer, thus correlating and adaptively weighting through the weights received by the weight generator of Kaku, one skilled in the art would recognize that the low-cost system would provide weighted (26 of Rilling) and summed (30) pairs of I and Q values.

Regarding claims 8 and 10, Akopian further teaches wherein the received signal is from a known signal source (GPS system, note col.1, line 15) and further teaches a trial frequency value (Wc in Fig.5).

Regarding claims 11 and 12, although Akopian teaches a trial frequency, Akopian does not explicitly teach a mid-point of each frequency interval to be the trial frequency. However, it would have been obvious to one skilled in the art at the time of the invention to implement as such, since the mid-point frequency value would provide an optimal choice to quickly shift between the left and right of the mid-point, thus efficiently adjusting the trial frequency, adjusting the frequency shit by the design choice as necessary, as taught by Akopian (note ol.8, lines 8-19).

Regarding claims 15-17,20-22,24 and 31, Akopian further teaches wherein all of the data blocks comprising the set of data blocks have the same length (having same code period), wherein the set of data are sampled (as received signals are samples, in Fig.5), and further wherein the frequency intervals are pre-selected (note col.8, lines 8-19 having interval of 1 kHz).

Regarding claims 18,23,25-28,30 and 32, Akopian further teaches wherein the received signal is a GPS signal (note col.1, line 15) determined based on intermediate frequency employed by a receiver and a Doppler shift associated with GPS vehicle (note col.1, line 37).

Regarding claims 9 and 29, Akopian further teaches wherein for each data block in the set of data blocks, the calculated correlation integrals are calculated for each hypothesized delay value over a range of hypothesized delay values (estimating code phase n_c , note col.5, lines 48-53).

Allowable Subject Matter

4. Claims 33-87 are allowed.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Ahn whose telephone number is (571) 272-3044. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sam K. Ahn
3/20/06

JAY K. PATEL
SUPERVISORY PATENT EXAMINER